with ATM switching and multiplexing, the exact amount of capacity or bandwidth is allocated on a moment-to-moment basis. While ATM is generally regarded as ideal for handling the very bursty and highly variable traffic associated with multimedia applications, assuring acceptable levels of service quality is inherently more difficult. With ATM, congestion control and bandwidth allocation mechanisms are much more complex because, not only does the number of "calls" or required connections vary, but the amount of capacity or bandwidth they require varies on a "real-time" basis as well. As I indicated, this significantly increases the complexity of the required interconnection arrangements between two networks.

IV. Risk of Successful Discrimination

Up to this point, two important points have been established in evaluating the power and the ability of Ameritech to engage in anticompetitive, discriminatory activities against unaffiliated long-distance carriers if they are granted authority to enter the in-region, interLATA services market prematurely. *First*, based upon the analysis contained in Section II and the updated analysis contained in ELB-II, the incumbent Local Exchange Carriers will retain bottleneck control over the local exchange network for the foreseeable future. Therefore, they have the power to discriminate against not only unaffiliated long-distance carriers but emerging local exchange carriers as well. *Second*, technical developments in local exchange networks in terms of (a) the deployment of common channel signaling systems, (b) the related development of AIN or software driven network elements, and (c) further developments in multimedia applications are resulting in the need for different and generally more complex forms of network interconnection.

In this section, I first explain how these conditions increase the risk that Ameritech and other BOCs will frustrate long-distance competition by discriminating against unaffiliated long-

distance carriers if they are permitted to enter the market. I will then explain how the example of Open Network Architecture confirms the existence of these risks.

A. Discrimination Against Unaffiliated IXCs

As described above, one major benefit of the developments in the incumbent's local exchange network is that the increased intelligence allows the individual fine-tuning or customization of services to meet specific customer requirements. But this very ability to customize means that the BOCs or other incumbent local exchange carriers can "fine tune" their local exchange networks to favor (a) their own interexchange operations over their interexchange carrier competitors and/or (b) their own end user customers over the end user customers of their interexchange carrier competitors. Stated another way, the incumbent local exchange carriers, including Ameritech, will have additional -- and generally more subtle -- methods of discrimination available to them.[16]

The relationship between customization based upon network intelligence and the need for cooperation by the incumbent local exchange carrier can be illustrated by an example. Consider a scenario in which an important customer of Ameritech in Detroit desires a customized switched voice service. This could arise when, for example, a regional department store chain or regional financial services firm wants incoming calls to its stores or offices handled in a customized fashion based on such things as the location from which the call originates, the time of day, information entered by the caller when the call is placed, information previously stored in the network based on information supplied by the customer, and the state of the incoming lines at the various

[16] While the discussion in this section focuses on discrimination against interexchange carrier competitors, the same techniques can be used against competing local exchange carriers.

locations. With the development of the Advanced Intelligent Network as described above, Ameritech and the other BOCs now have the capabilities (and are developing even more sophisticated capabilities) for providing such customized services.

Now assume that, besides operating stores or offices in the Detroit area, this large regional customer of Ameritech also operates stores or offices throughout Michigan and, hence, wants to include incoming calls in that area in the customized service they are seeking to procure. Further assume that this important customer decides to go through a competitive bidding process for acquiring the customized service.

One component of such a customized service might be the customer's need to have its own customers reach it by dialing a special local telephone number that is the same throughout the region in which it operates. That need might stem from the customer's desire to use a single number in its regional advertising campaigns and to avoid the high charges for 800 number calling for what would otherwise typically be a local call. Another component of the service might be that the customer wants calls to the common local number to be routed to its nearest office or store during normal business hours, but to a centralized 24-hour service desk in Detroit after hours. With the traditional telephone network architecture, such service features would be difficult or impossible to provide.

Because of the importance of the customer, Ameritech would surely seek to provide this customized service, as would several long-distance carriers. To have the service work as described, however, the long-distance carriers would have to obtain the cooperation of Ameritech because of its bottleneck control of the necessary local facilities.

The nature of the required cooperation can be gleaned from considering the proposed service in a little more detail. For example, say that the customized service involved the dialing of the prefix 203 when a subscriber was calling the large customer procuring the service. Dialing 203 would result in the local switch suspending the call briefly while a Service Control Point was being queried. Using the telephone number of the calling party and customer information stored in its data base, the Service Control Point would then send a message back to the local switch serving the subscriber placing the call. The message would contain the information necessary for the local switch to route the call to the office or store nearest to the subscriber's location, or if it were after hours, to the customer's 24-hour service desk in Detroit. Thus, one basic aspect of the required cooperation is that the local switches in both Detroit and, say, the Lansing and Grand Rapids areas would have to be equipped to recognize the prefix 203 as a trigger.

Having the local switch recognize a particular dialed number as requiring AIN handling is a relatively simple example of a trigger. More complex examples might include a request to recognize an entirely different type of trigger. An example of a different type of trigger would be the occurrence of an event while the conversation is taking place, i.e., after the call has been established or setup.

The potential use of a mid-call trigger can be envisioned in conjunction with the use of "debit cards" or "telecards" for paying for long-distance telephone calls.[17] Telecards are not credit cards because the telecard user buys the telecard from a retailer, say at a convenience store, and pays for the long-distance calling in advance. Because of this feature, telecards are

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[17] A general description of telecards and their advantages is contained in the Comments of the International Telecard Association in CC Docket No. 96-128, dated July 1, 1996. (Downloaded from http://www.telecard.org/subfinal.html on June 2, 1997.)

sometimes called prepaid phone cards. When the telecard user places a call, he or she must enter a number to identify and authenticate the card. The cost of the subsequent call is deducted from the remaining value of the card. In one implementation of a telecard system, the remaining value of each card is stored in a central data base. Telecard users are given a warning when the remaining balance falls below a certain amount. For example, the telecard users may be given a two-minute warning announcement before a disconnect would take place. The usefulness of the AIN architecture in providing telecard-based long-distance services should be apparent.

One problem with the use of telecards, however, is that the balance on the pre-paid card may run out during a particular call. After warning the telecard user that the balance on the card is about to be expended, it would be useful to allow the user to (a) "replenish" the card to avoid having the call prematurely terminated or (b) to enter the number of a second card that has a remaining balance. With this arrangement, instead of simply terminating the call, the user would be told to take some action to indicate his or her desire to continue the conversation. For example, the telecard user could be asked to execute a "switch-hook flash" to indicate acceptance of the option. The switch-hook flash indication from the card user would act as a mid-call trigger to start a card renewal process, e.g., to collect the additional digits to allow the call to continue. As stated in a recent National Reliability Council report:

> Access to AIN triggers implies that the local service provider's switch is equipped with the appropriate trigger detection software and that the local service provider allows the third-party service provider the use of these triggers for call control in support of features and services. The availability of triggers for third-party access in a multi-provider environment is another key AIN issue that the industry must

address. *Without access to local switch triggers, a third party service provider's ability to offer its own AIN services is limited.*[18] [Emphasis added.]

These examples illustrate how the BOCs, including Ameritech, can use the much greater complexity of the local exchange network to discriminate against unaffiliated long-distance carriers in the provision of increasingly important differentiated service offerings. Ameritech has more incentive to cooperate with itself than with an unaffiliated long-distance carrier such as MCI, or to state it another way, to discriminate against the unaffiliated carrier in negotiating and agreeing to make such changes in its local switches.

This expanded ability to discriminate includes a host of other potential anticompetitive actions. For example, the BOCs can refuse to provide interconnection at critical points in their intelligent network based on alleged technical harm to the network. They can refuse to convey certain types of control messages across the AIN for the same reason or because of claims that standards for a particular message type do not exist. As illustrated above, they can refuse to provide access to local switch triggers. They can refuse to provide certain forms of interconnection unless the signaling messages pass through some type of "filter" that they control -- a filter (or mediation function as it is often referred to) that is not actually needed to ensure the integrity of the network. They can use this control over the filter to artificially restrict the message sets to those associated with the services they wish to offer or to degrade the performance of a competitor's service offerings. These degradations can result from delays in the

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[18] Network Reliability Council (NRC) Reliability Issues - Changing Technologies Focus Group, Advanced Intelligent Network, Subteam Final Report, Section 5.9.1. (Reprinted in International Engineering Consortium, Intelligent Networks: Current Advances and Business Issues, Advances in Intelligent Networks Comprehensive Report Series, Vol. 2, 1997.)

filter or in a requirement for extra messages compared to their own connections. They can refuse to provide certain information collected from customers and stored in the network on the basis that the information is proprietary. They can refuse certain forms of interconnection and thereby force a competing carrier or other third party to store sensitive customer information on the BOC network rather than in its own network. An example of this would be a BOC refusal to provide interconnection between their SCP and a competitive interexchange carrier's data base. In the regional department store illustration provided above, this would force the competitor to place sensitive customer information on the BOC's data base. They can also refuse to develop, deploy, and execute certain types of service logic based on potential harm or developmental costs or priorities.

Rather than outright refusal, the BOCs, including Ameritech, can resort to a "slow roll" of their competitors or potential competitors. They can initially respond to an interconnection-related request (e.g., for the conveyance of a particular type of control message over the local signaling channel or the deployment of particular service logic) on the basis that they don't understand it technically; they can refuse to provide or be slow in giving the requester essential technical information; they can assert that the request is not technically feasible or must involve time-consuming study; after agreeing that it is technically possible, they can delay by arguing that standards must be developed; they can argue that any required modifications to the network will take a long time and require extensive testing. If they finally offer the requested capability, they can charge unreasonable prices.

In addition, in requesting modifications of the local switches necessary to provide new service offerings, the unaffiliated carrier would be forced to reveal technical information to its

competitor, Ameritech, on its intended technical approaches. This alone puts the unaffiliated carrier at a significant disadvantage. Ameritech could give its long-distance affiliate discriminatory access to this information, while protecting comparable information obtained from its affiliate from unaffiliated competitors.

Because of the technical complexity of the SS7/AIN architecture, the critical role it plays as the nervous system of the network, and the necessarily more limited technical knowledge of outsiders, determining whether a particular refusal or delay is justified becomes an almost impossible task for competitors and regulators alike. Faced with claims that certain competitively critical forms of interconnection (or unbundling) are not technically feasible or, especially, that they would cause harm to the network, it is almost certain that the regulator would not require the requested form of interconnection or that it would continue in such a cautious fashion that it would seriously hinder or delay the unaffiliated carrier. The ability to refuse or delay such requests puts Ameritech in the position of controlling the development of new and competitive services, both as to whether the new service is created at all or, more subtly, when it comes to market and who can provide it. Through these means, Ameritech and the other BOCs can extend their monopoly power over physical facilities (e.g., the local loop) upward into the signaling network and software driven service logic and thereby discriminate against their interexchange competitors.[19]

In summary, the increased complexity of the interface between local and long-distance networks increases the risk of discrimination and makes it more difficult for regulators to prevent,

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[19] Using their control over lower level signaling and switching functions to favor their own software driven services is not unlike the allegations that Microsoft has used its control over personal computer operating systems to unfairly dominate the market for applications software.

detect, and remedy it. This is in contrast to the early days of interexchange competition when competitors were largely satisfied if they could obtain the basic forms of interconnection required to achieve equal access and to offer "plain vanilla" long-distance service. With intensified competition and changing customer requirements, however, long-distance carriers, by necessity, have increased their use of network-based intelligence for differentiating their services from those of the competitors. However, as explained above, the provision of these differentiated, software-based services depends upon the cooperation of the local exchange carrier. The interexchange carriers are dependent upon incumbent local exchange carriers for certain critical information (e.g., state of the called line) and for the conveyance of that information across the local carrier's bottleneck facilities. In short, just at the time the long-distance carriers need more cooperation from the BOCs such as Ameritech, they face the prospect of the BOCs becoming competitors if in-region, interLATA service is granted prematurely. Because of the requirement for different and more complex forms of interconnection (e.g., those necessary to provide multimedia services), past experience with the interconnection of traditional voice and data networks will be less useful as a regulatory tool for preventing, detecting, and remedying discrimination.

B. The Example of ONA

Evidence of the ability of the incumbent local exchange carriers, including Ameritech, to raise claims of technical harm and technical infeasibility in the provision of advanced forms of interconnection and thereby discriminate and thwart or delay the development of advanced competitive services is contained in the history of Open Network Architecture before the FCC. In Computer Inquiry III, which was launched in 1985, the Commission determined that the BOCs should be allowed to provide unregulated enhanced services jointly with their regulated basic local

exchange services if they met certain conditions. In other words, they were relieved of the long-standing requirement to offer such unregulated services through a separate, arms-length subsidiary subject to a set of conditions.

One of the most important of these conditions was a requirement that the BOCs unbundle their local exchange networks and offer the resulting Basic Service Elements (BSEs) to all enhanced service providers (including their own internal enhanced service operations) on a tariffed basis and under the same terms and conditions. The notion was that both the BOCs and the unaffiliated providers would then use these basic building blocks to construct their own competitive enhanced service offerings. This concept of unbundled BSEs that the Commission tried to implement in the ONA proceeding is similar to the requirement for unbundled network elements in the '96 Telecommunications Act.

The concept of unbundling and allowing all enhanced service providers to have access to the basic building blocks of the local telephone network was called Open Network Architecture (ONA). With ONA, it appeared that the FCC had ordered the ultimate unbundling of the local exchange network into its component parts. However, the ONA Plans submitted to the Commission by the BOCs to meet the ONA requirements were based upon the "Model ONA Plan" developed by Bellcore (which was owned by the BOCs). The model destroyed the very essence of the ONA concept as originally envisioned by the Commission. It also failed as a true open architecture as that term is understood in the computer and telecommunications industries. It did so by introducing the concept of a Basic Serving Arrangement, or BSA, which essentially maintained the status quo by defining the fundamental building blocks to be equivalent to the degree of bundling in the existing local exchange network. What they ended up offering as BSEs

amounted to little more than enhancements to the custom calling features (such as call forwarding or call waiting) that were already available on modern local Central Office switches.[20] Thus, by using the Common ONA Model and raising claims of technical harm and technical infeasibility, the BOCs were able to prevent the adoption of a truly unbundled, open architecture as originally envisioned by the Commission. Moreover, the BOCs priced the BSAs (which enhanced service providers were required to acquire as a condition of obtaining the limited set of BSEs) so high that they have proven largely unattractive to enhanced service providers. Instead, enhanced service providers have continued to buy ordinary business lines in order to offer services to their own customers. These tactics, coupled with refusals to provide for the collocation of enhanced service provider equipment in their local Central Offices, effectively killed the Commission's initial attempts at unbundling.

Although the Commission, in the face of stiff BOC opposition, refused to order what it referred to as fundamental unbundling, it recognized that further unbundling might be in the public interest. Consequently, the Commission ordered the BOCs to study further unbundling through the Information Industry Liaison Committee (IILC) within the Exchange Carriers Standards Association (ECSA).[21] As a result of the FCC's order, the IILC eventually established a group to address issues relating to network unbundling. This group, named the Task Group for IILC Issue 026, included both BOC and non-BOC representatives. The Task Group for IILC Issue 026

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[20] For a more complete discussion of these issues see "Open Network Architecture: A Promise Not Realized," Hatfield Associates, Inc., Boulder, CO (April, 1988).

[21] Filing and Review of Open Network Architecture Plans, CC Docket No. 88-2, Phase 1, Memorandum Opinion and Order, 4 FCC Rcd 1, at 43, para. 72 (1988) (BOC ONA Order). The ECSA was subsequently renamed the Alliance for Telecommunications Industry Solutions (ATIS).

developed a physical and a logical unbundling plan for the local exchange network. In April, 1995, the Task Group reached consensus on Issue 026, and a full IILC meeting subsequently approved the closing documentation. It included the opening of 13 AIN interconnection points. Note that the IILC process alone took several years to complete and, while it led to agreement on some interconnection points, it still left unresolved a host of policy, regulatory, and business issues.

Two other developments during the IILC's deliberations on the unbundling issue are worth noting. First, in late 1991, the Commission launched a Notice of Inquiry to explore the public policy issues relating to the implementation of intelligent network architectures by local telephone companies.[22] The Commission's stated goal in the proceeding was "to encourage development of future local exchange networks that are as open, responsive, and procompetitive as possible, consistent with our other public interest goals, such as ensuring network reliability and integrity and avoiding the imposition of uneconomic costs."[23] It should be emphasized that, in launching the Notice of Inquiry, the Commission's primary focus was on giving third parties greater access to the intelligent network architectures being implemented by the BOCs rather than on unbundling local loops, switching, and transport.

As characterized by the Commission in the subsequent rulemaking proceeding,[24] parties other than the LECs responded by urging the Commission to intervene to ensure that the LECs

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[22] In the Matter of Intelligent Networks, CC Docket No. 91-346, Notice of Inquiry, 6 FCC Rcd 7256 (1991) (Notice of Inquiry).

[23] Notice of Inquiry, 6 FCC Rcd at 7256, para. 1.

[24] In the Matter of Intelligent Networks, CC Docket No. 91-346, Notice of Proposed Rulemaking, 8 FCC Rcd 6813 (1993) (Notice of Proposed Rulemaking).

do not frustrate competition by developing the intelligent network in a closed, proprietary manner that would foreclose open access. The Commission also noted that these parties argued that the intelligent network would be unlikely to develop properly in response to market forces because of (a) the LECs' bottleneck control over the interface between the intelligent applications and the network, (b) the LECs' control over further intelligent network technical developments and implementation, and (c) the LECs' historical resistance to opening their networks to applications by third parties.[25] According to the Commission, the LECs, on the other hand, strenuously argued that market forces were sufficient to ensure procompetitive development of the intelligent network. The Commission went on to note that "[t]hey [LECs] argue that regulatory action is unnecessary and potentially harmful as it could cause market distortions and network inefficiencies, even potentially compromising network reliability."[26]

In the face of the claims by the LECs/BOCs, especially those relating to network reliability, it is understandable that the Commission took a very cautious approach. It suggested rules and in those rules proposed that third parties only be given mediated access to the intelligent network through the Service Management System[27] rather than at the SCP or the local switch (SSP). It also suggested that it would adopt a serial approach in which mediated access might eventually be extended to the SCP and local switch, but only after careful examination of the

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[25] Notice of Proposed Rulemaking, 8 FCC Rcd at 6815, para. 14.

[26] Notice of Proposed Rulemaking, 8 FCC Rcd at 6815, para. 15. (Footnote omitted. The omitted footnote specifically refers to, among others, Ameritech's Comments and Reply Comments in the proceeding.)

[27] Service Management Systems are associated with the administration and maintenance of the SCPs in the AIN.

benefits and risks at each step. At the time that the Telecommunications Act of 1996 became law in February of 1996, the Commission had not issued an order actually requiring mediated access through the SMS and, as indicated above, the IILC was unable to agree on other forms of fundamental unbundling. Thus, almost exactly a decade passed between the time that the FCC set forth its vision of an unbundled, open local exchange architecture and the signing into law of the '96 Telecommunications Act in February of 1996, and no significant progress occurred during that time.

Not only was there a decade-long delay, it is likely that the unbundling requirements incorporated in the '96 Telecommunications Act resulted from a change in the BOCs' perception of their own strategic interests rather than from any fundamental technical development. Their acquiescence to the unbundling requirements was surely predicated upon obtaining relief from the line-of-business restrictions imposed by the Modification of Final Judgment. In other words, the movement toward a more unbundled, local network was due in a large part to the presence of other policy/regulatory incentives rather than a sudden change of heart regarding the desirability of providing access on such a basis. In short, the BOCs can speed up the provision of advanced forms of interconnection when it suits their strategic interests, and slow down or thwart them when they do not.

I want to make it clear that, in tracing this history of unbundling and ONA, I am not necessarily being critical of the Commission's past efforts to promote a more open architecture both in the original ONA and subsequent IN proceedings, nor in the steps it is taking in its interconnection proceeding to carry out portions of the '96 Telecommunications Act. Rather, I am using it as an example of how the BOCs, including Ameritech, can use claims of technical

harm and technical infeasibility in the provision of advanced forms of interconnection to thwart or delay the development of competitive services by unaffiliated long-distance carriers and other providers.

V. Response to the Affidavit of Daniel J. Kocher

Daniel J. Kocher submitted an affidavit with Ameritech's application to provide in-region, interLATA services originating in Michigan.[28] The Kocher Affidavit concludes that:

> ". . . from a technical perspective, Ameritech cannot reasonably engage in a concerted plan to discriminate in favor of itself or [the Ameritech affiliate] ACI, or against other telecommunications service providers. Furthermore, if Ameritech did attempt to engage in such discrimination, that discrimination would be easily detected.[29]

The joint affidavit of Richard J. Gilbert and John C. Panzar, also filed in support of Ameritech's application, relies, in turn, upon the Kocher Affidavit to reach certain conclusions regarding Ameritech's purported inability to discriminate against interexchange carriers competing with its long-distance affiliate.[30] Because the Kocher Affidavit deals with issues similar to the ones dealt with herein and because it reaches opposite conclusions to my own, I will address his analysis and conclusions in this section.

The essence of Mr. Kocher's conclusion is that discrimination in the quality of access services is impractical or infeasible. According to him, it is infeasible because such discrimination would involve modification of internal software and systems and would require the cooperation of

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[28] Affidavit of Daniel J. Kocher, dated May 20, 1997 (Kocher Affidavit).

[29] Kocher Affidavit, at 4, para. 6.

[30] Joint Affidavit of Richard J. Gilbert and John C. Panzar, dated April 28, 1997, at 17, para. 29.

vendors and Ameritech's own workers coordinated across several departments. He also concludes that these types of internal modifications are not only difficult or impossible to achieve without affecting the quality of Ameritech's own services but are also easily detectable. He argues that discrimination in the provision of services and network elements to other carriers is not practical "because they utilize facilities, switches and systems that were specifically designed to automatically furnish nondiscriminatory service."[31] Mr. Kocher points out that all categories of traffic (local, intraLATA toll, and interLATA toll) arrive on Ameritech's local network in random order, are carried on trunks and loops intermingled with traffic from many carriers, and users are switched by local and tandem switches pursuant to standard software and routing tables. He then goes on to conclude that "the prospect of [Ameritech] conducting a program of concerted discrimination . . . is wholly implausible."[32] I strongly disagree with portions of Mr. Kocher's analysis and conclusions.

Before presenting the reasons for that disagreement, I would like to make one general observation. Mr. Kocher essentially ignores the Intelligent Network concept and related developments that are making the local exchange network increasingly programmable or software driven as I described above. Instead, he focuses on lower level switching and transmission functions rather than on the higher level functions, i.e., the service logic and associated data bases that are so critical to service differentiation in the competitive long-distance market.[33] He only

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[31] Kocher Affidavit, at 4, para. 8.

[32] Kocher Affidavit, at 5, para. 8.

[33] Ameritech itself confirms the importance of such service differentiation in the interLATA market. In an accompanying affidavit, the joint affiants state that "[i]n a rapidly changing industry such as telecommunications, we anticipate that non-price consumer benefits, in the form of service

mentions AIN twice. He mentions it once in conjunction with Ameritech's SS7 network, but only in passing.[34] He mentions it again in conjunction with the deployment of two tandem switches by *ACI*, one in Detroit and one in Chicago. He does so in only one sentence: "Finally, both switches are equipped to support Advanced Intelligent Network ('AIN')-based services utilizing ACI's own SS7 network and databases."[35] In my opinion, failure to acknowledge and address Ameritech's ability to use its monopoly power over physical facilities (e.g., the local loop) to favor their own software driven services represents a serious omission on the part of the affiant.

I will now address what *is* discussed in the affidavit. Mr. Kocher argues that Ameritech's "computer-controlled [end office] switches are designed to operate under stored program control utilizing 'generic' software provided by the switch manufacturers."[36] He then argues that the software routines involved are designed to handle all traffic in a similar manner and that modification to that software would be impossible because it would jeopardize overall network reliability, the software is proprietary and controlled by the manufacturer, and any modification would void the manufacturer's warranty. Mr. Kocher ignores the fact that one of the most compelling motivations for separating the service logic from lower level switching functions (i.e., the intelligent network concept) was to allow *providers* to create new and different service offerings independent of the manufacturer and without waiting for the manufacturer to develop a

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innovations and technological advances, would likely confer greater benefits upon telecommunications users than would price-related benefits." Joint Affidavit of Robert G. Harris and David J. Teece, dated May 12, 1997, at 96.

[34] Kocher Affidavit, at 18, para. 36.

[35] Kocher Affidavit, at 43, para. 81.

[36] Kocher Affidavit, at 6, para. 12.

new software generic. For example, a recent Bell Atlantic-sponsored tutorial on the intelligent network states the following under a general heading entitled "Benefits of Intelligent Networks":[37]

> AIN technology uses the embedded base of stored program-controlled switching systems and the SS7 network. The AIN technology also allows for the separation of service-specific functions and data from other network resources. *This feature reduces the dependancy on switching system vendors for software development and delivery schedules. Service providers have more freedom to create and customize services.* [Emphasis added]

Or, as the Commission itself reported, ". . . the BOCs contend that a major goal of AIN is to free them from the 'tyranny' of the switch manufacturer."[38] Thus, contrary to Mr. Kocher's assertions to the contrary, the intelligent network concept enables the BOCs, such as Ameritech, to modify service logic in order to customize services for specific end user or carrier customers. As I showed earlier, it is this ability to fine tune or customize their local networks that enables them to favor (a) their own interexchange operations over their interexchange carrier competitors and/or (b) their own end user customers over the end user customers of their interexchange competitors.

As noted, Mr. Kocher does not address the intelligent network concept, except in passing. Although Mr. Kocher refers to AIN functionality primarily in conjunction with ACI's tandem switches, it would not be correct to infer that AIN technology (or intelligent network technology more generally) is associated only with tandems. The AIN architecture clearly provides for "intelligence" or service logic to be incorporated in SCPs and/or in Intelligent Peripherals or adjuncts associated with individual end office switches. For example, the Bell Atlantic sponsored tutorial referred to earlier (and relying upon the AIN Release 1 architecture defined by Bellcore)

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[37] "The Intelligent Network Tutorial," URL-http://www.iec.org/tutorial/ain/, downloaded February 2, 1997.

[38] Notice of Inquiry, 6 FCC Rcd at 7257, para. 5.

clearly shows an Intelligent Peripheral and adjunct connected directly to an end office SSP.[39] Indeed, in its comments in the Intelligent Network proceeding, Ameritech defines an adjunct as follows:

> An 'adjunct' is a network system that provides service-specific logic in response to an AIN switching system. Adjuncts contain logic and programs that permit them to exchange information with AIN switches regarding calls in progress. An adjunct is functionally equivalent to an SCP as a service logic execution platform, but the adjunct communicates with an AIN switch via high speed data links rather than via 56 kbps CCS links like the SCP.[40]

Thus, Ameritech could discriminate in favor of ACI or its customers by modifying the service logic residing in an SCP associated with an end office or in the attached adjunct.

Another area in which I strongly disagree with Mr. Kocher's conclusions relates to the provision of local distribution facilities, e.g., unbundled local loops. Essentially, he argues that (a) because the local loop facilities used to serve Ameritech's customers are co-mingled with the local loop facilities used by competitors and utilize the same distribution and feeder systems, and (b) because the loops are assigned by automatic systems that do not recognize the identity of the requesting carrier or customer, discrimination would be difficult to carry out and easy to detect.

However, just as the local exchange network is changing through the addition of increased intelligence that allows individual fine tuning or customization of services to meet specific customer requirements, so are the local distribution facilities. Rather than simply carrying ordinary analog voice and low-speed data signals, twisted pair copper loops are being used to carry high-speed digital signals as well. The products that permit the use of twisted pair copper

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[39] In some implementations, the adjunct may be referred to as a Service Node.

[40] Comments of the Ameritech Operating Companies in CC Docket No. 91-346, dated February 28, 1991, at footnote 5.

loops for carrying high-speed digital signals are often referred to generically as xDSL, where DSL is an acronym for Digital Subscriber Line. Varieties of xDSL include: High Data Rate DSL (HDSL), Symmetric DSL (SDSL), Asymmetric DSL (ADSL), Very High Data Rate DSL (VDSL), and Rate Adaptive DSL (RADSL). All of these products use sophisticated digital signal processing and other advanced techniques to make use of frequency ranges that lie above those ranges normally used by voice transmission. Through the use of multiplexing, these systems can be used to carry a mixture of local, intraLATA long-distance, and interLATA long-distance voice, data, image, and even video services directly to customer locations.[41]

Since all of these systems attempt to squeeze additional capacity out of loop plant that was designed to carry less demanding voice signals, their performance is dependent on the condition of the individual copper pairs and the presence of other digital signals. This means that many copper lines may require individual treatment in terms of reconditioning or rebuilding in order to carry high-speed digital signals directly to the customers' premises. It also means that the performance, once installed, is dependent upon how other digital signals (e.g., standard T1 and ISDN) signals are carried within the same cable sheath or binder group. Because of this need for individual treatment and the susceptibility of the systems to interference from other signals within the cable, there is a significantly increased risk that Ameritech will discriminate in favor of its own competitive operations. The risk increases because Ameritech alone controls the pace and diligence with which the reconditioning or rebuilding is accomplished and the placement of digital signals within the cable itself.

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[41] According to a recent trade journal article, three of the BOCs have promised ADSL services to consumers. See Snyder, Beth, "ADSL pledge," Telephony (May 26, 1997), at 7.

VI. Summary and Conclusions

To summarize, because of the increased complexity of the required forms of interconnection, incumbent local exchange carriers have an increased ability to discriminate and to raise unfounded claims of technical harm and technical infeasibility in the provision of advanced forms of interconnection. Thus, they have the power to thwart or delay the development of advanced competitive long-distance services that are increasingly critical to interexchange carriers in differentiating their services in an intensely competitive market. Because these advanced forms of interconnection go far beyond the basic forms of interconnection required to achieve equal access following divestiture, past experience with the interconnection of traditional voice and data networks will be less useful as a regulatory tool for preventing, detecting, and remedying discrimination.

I hereby swear, under penalty of perjury, that the foregoing is true and correct, to the best of my knowledge and belief.

Dale N. Hatfield

Subscribed and worn before me this 5th day of June, 1997.

Notary Public

[redacted]

My commission expires:_____

ATTACHMENT 2

STATE OF TEXAS)
) ss
COUNTY OF DALLAS)

AFFIDAVIT OF PETER P. GUGGINA

Peter P. Guggina, being duly sworn and under oath deposes and states as follows:

1. I am employed by MCI Telecommunications Corporation as the Director of Technical Standards Management. My office address is 2400 N. Glenville Drive, Richardson, Texas 75082. In this capacity, I am responsible for managing a staff that plans, coordinates and executes MCI's participation in the industry forums and standards process. My position provides a daily view of the status and events that take place in these arenas. In addition to participating directly in and monitoring other MCI participants' progress, I am in constant contact with other industry participants in an attempt to resolve issues and to make the process more effective.

2. I am also my company's representative to the Board of Directors of the Alliance for Telecommunications Industry Solutions (ATIS),[1/] formerly the Exchange Carrier Standards Association (ECSA), which sponsors many telecommunications standards setting bodies and industry forums. In addition, I

[1/] ATIS's stated mission is to promote the timely resolution of national and international issues involving telecommunications standards and the development of operational guidelines.

am also MCI's representative to the American National Standards Institute (ANSI). I also serve as Vice-chair to the Carrier Liaison Committee (CLC),[2/] which provides oversight management of the ATIS/CLC forums. Further, I am Chairman of the Interexchange Carrier Industry Committee ("ICIC"), an industry group that reviews technical subject matters associated with exchange access services. Chairing the ICIC provides me additional exposure to a cross section of industry activities related to the forum and standards process. My involvement with these industry activities began in 1984, and I have over 20 years of telecommunications operation, engineering, and network planning experience.

3. I am submitting this Affidavit in connection with the FCC's proceedings in Computer III Further Remand Proceedings: Bell Operating Company Provision of Enhanced Services, Docket No. 95-20.

4. Enhanced services markets will be strongly affected by the technical standards that define whether and how various public switched telephone network features and services are made available to enhanced service providers (ESPs). Quite simply, these standards, and the implementation thereof, will

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[2/] The CLC's stated mission is to provide interindustry mechanisms for the discussion and voluntary resolution of nationwide concerns regarding the provision of exchange access and telecommunications network interconnection. The CLC is an umbrella organization for the Ordering and Billing Forum (OBF), the Network Operations Forum (NOF) and the Industry Carriers Compatibility Forum (ICCF).